



- Note:
- Horizontal stringers - In lieu of perforated tubes, the contractor may substitute z bar stringers. The z bar stringers shall be 1 3/4" x 3/16" thick, 1.08 lbs./ft. aluminum or 3.16 lbs./ft. steel.
 - Metal washer used on sign face shall have a minimum outside diameter of 1 5/16" ± 1/16" and 10 gauge thickness.
 - No Parking Signs: All no parking signs with directional arrows shall be placed at a 30 to 45 degree angle with the line of traffic flow. No parking signs required at the above angles may have the support turned to the correct angle. If the no parking sign is placed with another sign that has to be placed at a 90 degree angle with the line of traffic flow, the detailed angle strap should be used to mount the no parking sign. Material used for the attachment strap shall be included in the price bid flat sheet for signs. Flat washers and lock washers shall be used with all nylon washers.
 - 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
 - Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3"x 3"x 7 gauge ASTM A500 Grade B. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/A153. All tolerances on anchor unit and slip base bottom assembly are ± 0.005 unless otherwise noted.
 - When used in concrete sidewalk, anchor shall be the same except without the wings.
 - Four post signs shall have over 8' between the first and fourth posts.
 - In lieu of using the bent bolt to attach the post to stringer, the contractor may choose to punch the sign backing and place the bolt through the sign, the stringer and the post.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2 1/4	12
1	2 1/4	12			No	2 1/2	12
1	2 1/2	12			(B)	3(C)	10
1	2 1/2	10			Yes		10
1	2 1/4	12	2	12	Yes		12
1	2 1/2	12	2 1/4	12	Yes		12
2	2 1/2	10			Yes		10
2	2 1/4	12	2	12	Yes		12
2	2 1/2	12	2 1/4	12	Yes		12
3 & 4	2 1/2	12			Yes		12
3 & 4	2 1/2	10			Yes		10
3 & 4	2 1/2	12	2 1/4	12	Yes		12
3 & 4	2 1/4	12	2	12	Yes		12
3 & 4	2 1/2	10	2 3/16	10	Yes		10

(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

(C) - 3" anchor unit

Telescoping Perforated Tubes							
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In. 4	Cross Area Sq. In.	Section Modulus In. 3	
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172	
2 x 2	0.105	12	2.416	0.372	0.590	0.372	
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499	
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590	
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643	
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785	

The 2 3/16" size 10 gauge is shown as 2.19" size on the plans.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-1-86	
REVISIONS	
DATE	CHANGE
04-12-99	Anchor unit
06-25-99	Added note 7
10-04-99	Post pay length
02-10-00	Remove shim detail
11-21-02	Revise anchor unit and stringer mounting
02-23-03	3" anchor unit
12-01-04	PE stamp added
12-13-05	Revised table
04-24-06	Reinforcing sleeve, Added note 8

This document was originally issued and sealed by MARK S GAYDOS, Registration Number PE-4518, on 04/24/06 and the original document is stored at the North Dakota Department of Transportation